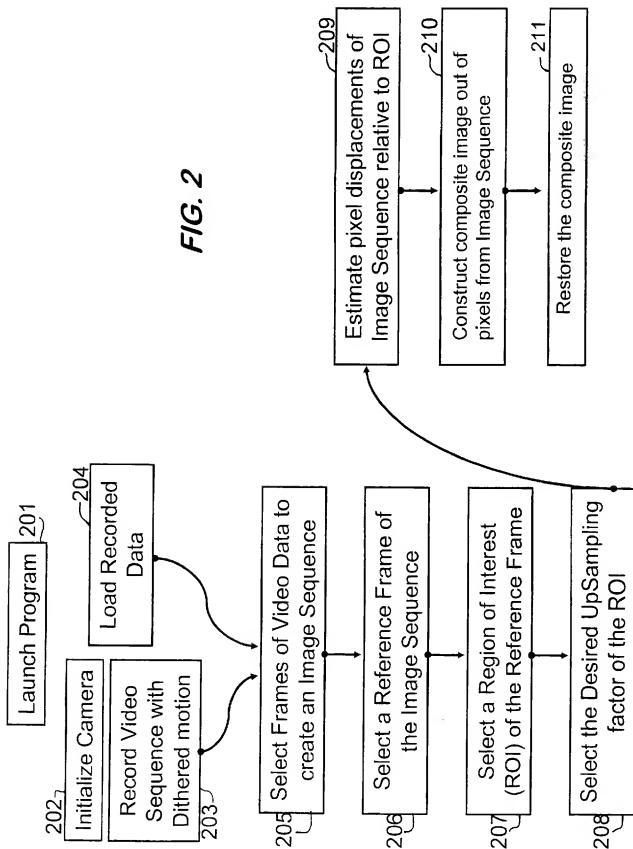


**FIG. 2**



```

function [shift] = grad_est(ref,tgt);
ref = double(ref);
tgt = double(tgt);
S000 = (ref(1:end-1,1:end-1));
S100 = (ref(2:end-0,1:end-1));
S010 = (ref(1:end-1,2:end-0));
S110 = (ref(2:end-0,2:end-0));
S001 = (tgt(1:end-1,1:end-1));
S101 = (tgt(2:end-0,1:end-1));
S011 = (tgt(1:end-1,2:end-0));
S111 = (tgt(2:end-0,2:end-0));
%
dSdx1 = (S100-S000+S110-S010+S101-S001+S111-S011)/4;
dSdx2 = (S010-S000+S110-S100+S011-S001+S111-S101)/4;
dSdx3 = (S001-S000+S101-S100+S011-S010+S111-S110)/4;
%
aa = dSdx1.^2;
a = sum(aa(:));
bb = dSdx2.^2;
b = sum(bb(:));
ab = dSdx1.*dSdx2;
d = sum(ab(:));
A = [a d; d b];
%
ac = dSdx1.*dSdx3;
bc = dSdx2.*dSdx3;
B = -[sum(ac(:)) sum(bc(:))];
%
shift = A \ B;
shift = shift';

```

**PRIOR ART****FIG. 7**